Memoirs of the General Helvetic Society (vol. xxiv.) a review of the genus *Theobroma*, after having compared his specimens in the herbaria of Kew, Berlin, and Geneva.

The biological interest of the Mediterranean Region, which includes Southern Europe, the north coast of Africa, and those lands vaguely termed the Levant, is in many respects the opposite of that of the great Russian empire. Extending from the Straits of Gibraltar to the foot of the Caucasus and Lebanon, over 40 to 45 degrees of longitude, by 10 to 12 degrees of latitude, from the southern declivities of the Pyrenees, of the Alps, the Scardus, and the Balkan, to the African shores, it shows, indeed, a certain uniformity of vegetation through the whole of this length and breadth; but it has evidently been the scene of great and frequent successive geological convulsions and disturbances, which, whilst they have wholly or partially destroyed some of the races most numerous in individuals, have at the same time so broken up the surface of the earth as to afford great facilities for the preservation or isolation of others represented by a comparatively small number of individuals. The consequence is that there is probably no portion of the northern hemisphere in the Old World, of equal extent, where the species altogether, and especially the endemic ones, are more numerous, none, I believe, which contains so many *dissevered* species (those which occupy several limited areas far distant from each other), and certainly none where there are so many strictly local races, species or even genera, occupying in few or numerous individuals single stations limited sometimes to less than a mile. In all these respects the Mediterranean region far exceeds, absolutely as well as relatively, the great Russian region, which has three times its length and twice its breadth; it presents, also, perhaps almost as great a contrast to a more southern tract of uniform vegetation extending across the drier portion of Africa and Arabia as far as Scinde. This diversified endemic and local character exemplified in the plants of the Mediterranean region has, as far as I can learn, been observed also in insects.

Of the three great European peninsulas which form the principal portion of the region, the Italian is the narrowest and has the least of individual character in its biology, but it is the most central one, and, including its continental base with the declivity of the Alps, may be taken as a fair type of the region generally; it is also by far the best known. Italy was the first amongst European nations to acquire a name in the pursuit of natural science after emerging from the barbarism of the middle ages; and although she has since been more devoted to art, and has allowed several of the more northern states far to outstrip her in science, she has still, amidst all her vicissitudes, produced a fair share of eminent physiologists as well as systematic zoologists and botanists; and within the last few years the cultivation of biology appears to have received a fresh impulse. It is only to be hoped that it may not be seriously checked by local and political intrigues, which appear to have succeeded, in one instance at least, in conferring an important botanical post on the least competent of the several candidates. Amongst the various publishing academies and associations mentioned in my address of 1865, the Italian Society of Natural Sciences at Milan issues a considerable number of papers on Italian zoology; and a few others in zoology and palæontology are scattered over the publications of the Academies of Turin and Venice and of the Technical Institute of Palermo. From the lists I have received, there appear to have been recent catalogues of Sicilian and Modenese birds by Doderlein in the "Palermo Journal," of Italian Araneida and Modenese fishes by Canestrini in the "Milanese Transactions," and of Italian Diptera, commenced by Rondani in the Bulletin of the Italian Entomological Society. Malacology, so peculiarly important in the study of the physical history of the Mediterranean region, has produced numerous papers, chiefly in the Milanese Transactions, and in Gentiluomo's "Bulletino Malacologica," and "Biblioteca Malacologica" published at Pisa. I also learn that at the time of the decease of the late Prof. Paolo Savi, in the beginning of April, the manuscript of his "Ornitologia Italiana" was complete, and had just been placed in the printer's hands.

In Botany, Parlatore's elaborate "Flora Italiana" has continued to make slow progress. We have received up to the second part of the fourth volume, reaching as far upward as Euphorbiaceæ, having commenced with the lower orders. The old Journal of Botany ceased with the year 1847, as I presumed to have been the case when I mentioned it in 1865, and has since been replaced by a "Nuovo Giornale Botanico Italiano," which continues, with tolerable regularity, issuing four parts in the year, the last received being the second of the third volume. The most valuable of the systematic papers it contains are Beccari's descriptions of some of his Bornean collections. Delpino, well known for his interesting dichogamic observations, as well as for some rather imaginative speculations, has also contributed to systematic botany a monograph of Marcgraviaceæ, but, unfortunately, without sufficient command of materials for the compilation of a useful history of that small but difficult group, and with a useless imposition of new names to forms which he thinks may have been already published, but has not the means of verifying. De Notaris, under the auspices of the municipality of Genoa, has published a synopsis of Italian Bryology, forming a separate octavo volume of considerable bulk.

Of the other two great European peninsulas I have little to say, notwithstanding their great comparative biological importance. The Western or Iberian Peninsula is the main centre of that remarkable Western flora to which I specially alluded in 1869, and which, more perhaps than any other, requires comparison with entomological and other faunas. But Spain is sadly in arrear in her pursuit of science. With great promise in the latter half of the last century, and certainly the country of many eminent naturalists, especially botanists, she has now for so long been subject to chronic pronunciamentos that she leaves the natural riches of her soil to be investigated by foreigners. Willkomm and Lange's "Prodromus Floræ Hispanicæ," which, when I last mentioned it, was in danger of remaining a fragment, has since been continued, and, it is hoped, will shortly be completed by the publication of one more part. I have no notes on any recent zoological papers beyond Steindachner's Reports on his Ichthyological tour in Spain and Portugal, and the Catalogues of the Zoological Museum of Lisbon publishing by the Lisbon Academy of Sciences. The Eastern Peninsula, Turkey, and Greece, with the exception of some slight attempts at Athens, has no endemic biological literature, and, with its present very unsatisfactory social state, affords little attraction to foreign visitors. The Levant, in respect of Botany at least, has has been much more fully investigated; but there, as in Turkey, much yet remains to be done; and pending the issue of Boissier's second volume already mentioned, I know of nothing of any importance in the biology of the East Mediterranean region as having been worked out within the last two or three years. As a hiatus, however, and yet a link between the Indian and the European Floras and Faunas, it will amply repay the study to be bestowed upon it by future naturalists.

(*To be continued*)

ASTRONOMY

On the Great Sun-spot of June 1843 *

ONE of the largest and most remarkable spots ever seen on the sun's disc appeared in June 1843, and continued visible to the naked eye for seven or eight days. The diameter of this spot was, according to Schwabe, 74,000 miles; so that its area was many times greater than that of the earth's surface. Now, it has been observed during a number of sun-spot cycles that the larger spots are generally found at or near the epoch of the greatest numbers. The year 1843 was, however, a *minimum* epoch of the eleven-year cycle. It would seem, therefore, that the formation of this extraordinary spot was an anomaly, and that its origin ought not to be looked for in the *general cause* of the spots of Schwabe's cycle. As having a possible bearing on the question under consideration, let us refer to a phenomenon observed at the same moment, on the 1st September, 1859, by Mr. Carrington, at Redhill, and Mr. Hodgson, at Highgate. "Mr. Carrington had directed his telescope to the sun, and was engaged in observing his spots, when suddenly two intensely luminous bodies burst into view on its surface. They moved side by side through a space of about thirty-five thousand miles, first increasing in brightness, then fading away. In five minutes they had vanished. . . . It is a remarkable circumstance that the observations at Kew show that on the very day, and at the very hour and minute of this unexpected and curious phenomenon, a moderate but marked magnetic disturbance took place, and a storm, or great disturbance of the magnetic element, occurred four hours after midnight, extending to the southern hemisphere." The opinion has been expressed by more than one astronomer that this phenomenon was produced by the fall of meteoric matter upon the sun's surface. Now the fact may be worthy of

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note that the comet of 1843, which had the least perihelion distance of any on record, actually grazed the solar atmosphere about three months before the appearance of the great sun-spot of the same year. The comet's least distance from the sun was about 65,000 miles. Had it approached but little nearer, the resistance of the atmosphere would probably have brought its entire mass to the solar surface. Even at its actual distance it must have produced considerable atmospheric disturbance. But the recent discovery that a number of comets are associated with meteoric matter, travelling in nearly the same orbits, suggests the inquiry whether an enormous meteorite following in the comet's train and having a somewhat less perihelion distance, may not have been precipitated upon the sun, thus producing the great disturbance observed so shortly after the comet's perihelion passage.

DANIEL KIRKWOOD

Bloomington, Indiana

SCIENTIFIC SERIALS

OF the *Sitzungsberichte der naturwissenschaftlichen Gesellschaft Isis in Dresden* we have received the concluding part of the volume for 1869, containing the proceedings of the Society for the months of October, November, and December. Its contents are as usual of the most varied character, and we shall therefore notice only a few of the more prominent papers. In the section for prehistoric archæology Dr. Mehwald gave an interesting notice of the researches made in Norway by a young student, M. Lerange, and further a general account of ancient mining and mining implements. Under the zoological section we find an abstract by Prof. Günther of the faunistic results of recent deep-sea dredgings, founded of course chiefly upon the reports of MM. Pourtales and Agassiz, and our countrymen Messrs. Thomson, Jeffreys, and Carpenter. Under the head of mathematics, physics, and chemistry, is a paper by M. F. Otto on the calamine deposits in Upper Silesia, which would have better taken its place as a geologico-mineralogical paper. An important botanical paper is the revision by Dr. L. Rabenhorst of the Cryptogamia collected in the East (especially in Persia) by Prof. Haussknecht, in which the author catalogues a considerable number of Fungi and Lichens, and describes several new species and a new genus of the former class. The new genus *Seirosporium* belongs to the Discomycetous family Phacidiacei, and the species *S. ocellatum*, which is figured, lives upon dry stems of *Astragalus deinacanthus* Boiss. The new species described belong to the genera *Synchytrium* (2), *Ustilago* (2), *Uromyces* (1), *Puccinia* (2), *Cyathus* (1), *Montaguea* (1, figured), *Coprinus* (1), *Dothidea* (1), *Melogramma* (1), *and Rhytisma* (1).

THE fourth part of vol. xxii. of the *Zeitschrift der deutschen geologischen Gesellschaft* (1870) contains several very important memoirs. The first of these is upon new and little known Crustacea from Solenhofen by Prof. Kunth, illustrated with two plates, and includes detailed descriptions of the Stomatopod *Sculda pennata* (Münst), and of two new species of the same genus; and among the Isopods of *Urda rostrata* (Münst) forming the type of a new family *Urdaidæ*, *Reckur punctatus* (Münst), also referred to the genus *Urda*, *Narauda anomala* (Münst), and a species of *Æga*.—From M. Lemberg we find a detailed and valuable chemico-geological investigation of some calcareous deposits of the Finnish Island of Kimito, in which the author not only describes the chemical composition and mechanical condition of the rocks under consideration, but discusses at considerable length some interesting points connected with the general theories of rock-formation.—M. E. Kayser commences a series of studies of the Devonian of the district of the Rhine with a disquisition on the deposits of that age in the neighbourhood of Aix la Chapelle.—M. C. Weiss publishes an investigation of the Odontotopterides, in which he discusses the forms to be referred to that group, and comes to the conclusion that the whole may be placed under the genus *Odontopteris*, which he divides into two sections, *Xenopterides* and *Callipterides*, the former including as sub-genera, *Mixoneura*, *Xenopteris*, and *Lescuropteris*; and the latter *Callipteris*, *Anotopteris*, *Cullipteridium*. He gives a list of the species referable to each of these sub-genera, with remarks upon their characters and distribution; several of them are described as new and figured, with others, in the three plates with which the memoir is illustrated.—These papers are followed by some mineralogical notices by Prof. Rammelsberg treating of the meteoric stone of Chantonnay, of the sulphide of iron of meteoric irons, the composition of Lievrite, and the Anorthite rock of the Basto.—In the concluding paper of this number M. G. Berendt notices the occurrence of Cretaceous and Tertiary deposits near Grodno on the Niemen.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, June 15.—"On the Fossil Mammals of Australia. Part V. Genus *Nototherium* Ow." By Prof. R. Owen, F.R.S. The genus of large extinct Marsupial herbivores which forms the subject of the present paper, was founded on specimens transmitted (in 1842) to the author by the Surveyor-General of Australia, Sir Thomas Mitchell, C.B. They consisted of mutilated fossil mandibles and teeth. Subsequent specimens confirmed the distinction of *Nototherium* from *Diprotodon*, and more especially exemplified a singular and extreme modification of the cranium of the former genus. A detailed description is given of this part from specimens of portions of the skull in the British Museum, and from a cast and photographs of the entire cranium in the Australian Museum, Sydney, New South Wales. The descriptions of the mandible, and of the dentition in both upper and lower jaws, are taken from actual specimens in the British Museum, in the Museum of the Natural History at Worcester, and in the Museum at Adelaide, S. Australia, all of which have been confided to the author for this purpose. The results of comparisons of these fossils of *Nototherium* with the answerable parts in *Diprotodon*, *Macropus*, *Phascolarctos*, and *Phascolomys*, are detailed.

Characters of three species, *Nototherium Mitchelli*, *N. inerme*, and *N. Victoriæ*, are defined chiefly from modifications of the mandible and mandibular molars. A table of the localities where fossil *Nototherium* has been found, with the dates of discovery, and the names of the finders or donors is appended. The paper is illustrated by subjects for nine quarto Plates.

"On the Organisation of the Fossil Plants of the Coal-measures. Part II. *Lepidodendra* and *Sigillariæ*." By Prof. W. C. Williamson, F.R.S. The *Lepidodendron selaginoides* described by Mr. Binney, and still more recently by Mr. Carruthers, is taken as the standard of comparison for numerous other forms. It consists of a central medullary axis composed of a combination of transversely barred vessels with similarly barred cells; the vessels are arranged without any special linear order. This tissue is closely surrounded by a second and narrower ring, also of barred vessels, but of smaller size, and arranged in vertical laminæ which radiate from within outwards. These laminæ are separated by short vertical piles of cells, believed to be medullary rays. In the transverse section the intersected mouths of the vessels form radiating lines, and the whole structure is regarded as an early type of an exogenous cylinder; it is from this cylinder alone that the vascular bundles going to the leaves are given off. This woody zone is surrounded by a very thick cortical layer, which is parenchymatous at its inner part, the cells being without definite order, but externally they become prosenchymatous, and are arranged in radiating lines, which latter tendency is observed to manifest itself whenever the bark cells assume the prosenchymatous type. Outside the bark is an epidermal layer, separated from the rest of the bark by a thin bast-layer of prosenchymna, the cells of which are developed into a tubular and almost vascular form; but the vessels are never barred, being essentially of the fibrous type. Externally to this bast-layer is a more superficial epiderm of parenchyma, supporting the bases of leaves, which consist of similar parenchymatous tissue. Tangential sections of these outer cortical tissues show that the so-called "decorticated" specimens of *Lepidodendra* and of other allied plants are merely examples that have lost their epidermal layer, or had it converted into coal; this layer, strengthened by the bast-tissue of its inner surface, having remained as a hollow cylinder, when all the more internal structures had been destroyed or removed.

From this type the author proceeds upwards through a series of examples in which the *vessels* of the medullar become separated from its central *cellular* portions and retreat towards its periphery, forming an outer cylinder of medullary vessels, which are arranged without order, and enclose a defined cellular axis. At the same

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